Interactive Multimedia Learning Arithmetic and IQ

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Table of Contents

Chapter 2 Literature Review

Chapter 3 Methodology

Chapter 4 System Design

Chapter 5 System Implementation

Chapter 6: System Testing

Chapter 7: System Evaluation

Abstract

One of the most rapidly changing and exiting areas of education today is the development of computer based learning materials, especially interactive multimedia program that run on personal computer. These new technologies offer children, student and other people access to materials as never before. Through the condensed storage capabilities of computer, multimedia can deliver large amount of information in the ways that make it manageable, approachable and useful. And by making it possible to access illustration and photographs, sound and video, as well as large amount of text, interactive multimedia program present learning arithmetic and IQ test to children in newly engaging and meaningful way.

This Interactive Multimedia Learning Arithmetic and IQ are for children between 8 to 12 years old. This report focuses on developing the arithmetic skills and IQ knowledge for the children. There are two phases in this package, that is learning arithmetic and IQ knowledge for the children.

The 'waterfall model' was selected for the development process because it supports rapid application development and reduces the risks involves. Software engineering principles based on this methodology were applied throughout the development phase.

Acknowledgement

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Secondly, during the entire system development period of through completion of this thesis, I had the opportunity of discussing web-based system and learning arithmetic related issue with many people. They are few individuals who stand out for having provided me with considerable information, helped in requirement gathering, system design, implementation and a few other activities. Among them are Mr. Inthere Kumar, Mr. Subramaniam, primary school teacher, Mr. Anathan, Mr. Kumaresan, Mr. Suresh and Mr. Mohan, my faculty senior providing me guidelines on the reporting of this thesis.

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List of Figures

List of Tables

Chapter 1 : Introduction

1.0 Overview of The Thesis

This report is about developing and interactive multimedia learning skill package based on **arithmetic** and **IQ** knowledge. This report focuses on developing the arithmetic skills and IQ knowledge for the children. There are two phases in this package, that is learning arithmetic and IQ Test for the children between 8-10 years old.

The tools that are used to develop this package are combination of programming tools, ASP (Active Server Page) and authoring tools, Flash version 5.0, Director 8.0, Xara 3D max and Adobe Photoshop 6.0.

1.1 Arithmetic

1.1.1 Definition of Arithmetic

Arithmetic is a study of number such as 1,2,3,4..... under various operations of which the simplest are subtraction, addition, multiplication, and division. There are called 'Four Rules'. The word arithmetic is decided from Greek arithmetic, meaning number.

1.1.2 The 'Four Rules' of Arithmetic

a) Addition

The symbol for addition is + (Plus) from the Latin, meaning more, it is placed between two numbers to be added together for example, 5 + 2 mean 'Five plus two' or 'two plus five'. We can use the symbol repeatedly between numbers to be added, example 5 + 2 + 3 1.....

b) Subtraction

The symbol for subtraction is – (minus), from the Latin, meaning less, it is placed between two numbers, when the second is to be taken away from the first. For example , 5 - 2 means 'five minus two'. That mean the number two must be taken away from the number five. So, the solution is three.

C) Multiplication

The symbol for multiplication is x (times). When we have a number added to itself several times, we shorten the process considerably by multiplication, for example, 4 x 5, that we reading as 'four times five' is 4 + 4 + 4 + 4 + 4 = 20 or 5 + 5 + 5 + 5 = 20

d) Division

The symbol for division is % (divide), Division is the process of sharing. For example 20/5 means ' twenty divided by five' or ' if twenty were divided into five equal groups, how many would there in each group.

1.2 IQ Test

1.2.1 History of IQ Test

Almost all of the theories discussed before, have in common use of fairly complex task for gauging intelligence in both children and adults. Some of this tasks have been explicitly discussed. For example, those requiring recognition of analogies, classification of similar terms, extrapolation of number series and the like.

Although the kind of complex tasks that have been discussed above fall into a single tradition for the measurement of intelligence, the field actually has two major traditions. The tradition that has been discussed most prominently and has been most influentialis that of the Alfed Binet, French psychologist. But an earlier tradition, and one that still show some influence upon the flield is that of the English Scientist, Sir Francis Galton.

The concept of the mental age has fallen into disrepute, and few test continue to involve the computation of mental ages many tests still yield an IQ, but they are most often computed on the basis of statistical distributions. The scores are assigned on the basis of what percentage of people of given group would be expected to have a certain IQ.

1.2.2 Online IQ Test

With the current expansion of the world wide web (www), more and more information is being put on the Internet including in the field of education. Interactive Learning Arithmetic and IQ skills are an online web site that create good environment to user to learn and test their arithmetic skills and also their IQ level. The main objective of this project is to develop an attractive, interactive and user friendly online learning arithmetic, interactive and user friendly online learning arithmetic and IQ skills package by using ASP (Active Server Page) and flash 5.0.

1.3 Objectives

Children would prefer to get help from system than manuals because of its interactivity and attractive interface and also its convenience. Interactive Multimedia Learning Arithmetic and IQ knowledge skills. Objectives are :

A) Based on an arithmetic :

- To increase the learning of the participation arithmetic children by making more effective

- Increase and improve the arithmetic solving capabilities for children.

B) Based on IQ knowledge :-

- To increase the IQ knowledge of the children.

- To improve the quality of General knowledge that they have

Other than that :

- Easy learn tutorial system
- To encourage user to know more about arithmetic and IQ.
- Dynamic and interactive online IQ test.
- To study an multimedia element and it's advantages in teaching and learning.
- To provide an efficient learning environment to children who may or may not have prior exposure to the subject content.
- To provide help at their own time and their own place
- To provide an interactive multimedia help by producing the contents in a intelligent way

1.4 Thesis scope

The scope of this thesis is to develop the learning skills of arithmetic and IQ knowledge program for children. The focus of this research is to provide an intelligent computer based teaching system. It is for improve the capacity of learning and solving problem. This system consists of modules :

- Introduction module
- Registration module
- Main menu module

- Topic module
- The Learning module
- Quiz module
- The test module
- Ending module

1.5 Using Multimedia in Education

One of the main reason for using multimedia in education are to increase the interactivity of learning process. Production manager Alchemedia in Kismarnock Nathan Ling says that figure in 'data mintor' shows that, 10% from that we learn are from reading where else 40% is from listening, seeing. This figure will increase up to 75% if we listen and see something frequently.

Base on this, we can see that, multimedia are method that is very useful in that education system. This shows, that multimedia package is helping users to see and listen using text, graphic, audio, animation and video in an environment learning package.

Research from Commadore shows that multimedia will increase the power of memory of student up to 40%, capable of learning something increase to 30% and it also help to reduce time consumption to analyze something to ¼ from the real time.

1.6 Research Plan

Project plan is very important to define project scope, describe potential environment, specify define and arrange in order duties that should be taken and also prepare some basic control in the project.

All this have to be in order according the importance, that id to improve and develop system effectively.

Overall, the research plan are :

- Basic research on the project
- Definition on the scope project
- System analysis and system design
- Develop system and text of the system
- Evaluate the system and make necessary change

1.7 Development strategic

In this project, the development strategy is based on *The Classic Life Cycles*, its called *"Waterfall Model"*. The life-cycle paradigm development that begins at the level and progresses through analysis, design, coding, testing, and maintenance. The classical life cycle is the oldest and the most widely used paradigm for software engineering.

There are six main phase in the development of this multimedia learning skills package. Each phase will be discussed in detail in the following chapter 3:

1. Analysis requirement phase
2. System design phase
3. Prototyping
4. Implementation and Unit Testing
5. Integration and system testing
6. Operation and maintenance

1.8 Expected outcomes

Generally, this Interactive Multimedia Learning Arithmetic and IQ skills system is an enhancement of existing web application available on internet. There will be some application available on internet. There will be some added features and characteristics especially on graphics display animation, audio and vide clips. The user will be entrained as long as they are on the system. The main expected outcome of this system is the system should be at its best to attract to user to sit for real IQ test and also really can improve their arithmetic skills.

1.9 Overview of The Chapters

This document consists of four chapter, namely:

1.9.1. Chapter 1 : Introduction

Present an overall view of the Interactive Multimedia Learning arithmetic and IQ knowledge skills, the objectives of this project, the scope of this learning skills package and its features.

1.9.2. Chapter 2 : Literature Review

describes the background research done based on the requirement of the thesis. Multimedia and its advantages and disadvantages, CAL, CBL and HCI are discussed in this chapter.

1.9.3. Chapter 3 : Methodology

Concern about the analysis done of this project, research plan and methods, software and hardware. And also concern about the development strategic more detail.

1.9.4. Chapter 4 : System Design

Explains the design stage of this project where by various designs are developed in order to facilitate the coding process. This chapter will focus on design of the database, process flow and screen designs.

1.9.5. Chapter 5: System Implementation

In this phase, most of the work is done on coding and debugging. Here, various tools are used for developing this system. Programming language features and method of implementing those codes can profoundly affect the system quality and maintainability.

1.9.6 Chapter 6: System Testing

System testing is one of the main phases in the Water Fall Model. In the phase, the process of testing and debugging are done to detect defects and bugs of a system. These processes are usually done incrementally with system development. This phase is also often referred to as verification and validation. Verification refers to the set of activities that ensure that the system correctly implements a specific function. Validation refers to a different set of activities that ensure that has been built is traceable to user requirements.

1.9.7. Chapter 7: System Evaluation

System evaluation is the process of identifying system strength and limitation by measuring the system being built against expectations. During the period of coding and implementation of this system, various problems were encountered. These problems will solved, through references on notes documentation, notes users discussion groups and discussion among friends. These step have helped me to identify the system's strength, limitation and enhancements.

Chapter 2 : Literature Review

2.0 Introduction

Literature review is the background research done based on the information and requirement for develop this *Interactive Multimedia Learning Arithmetic's and IQ* skills project. This is because to increase the requirement and more understanding about the thesis.

Prior to the development of this project, research has been done on certain crucial. The topic that I have been researched:

- Important of arithmetic and IQ knowledge to children
- The problem that children face in studying arithmetic
- Computer Assisted Learning (**CAL**)
- Human Computer Interactive (**HCI**)
- Benefits of multimedia in education
- Multimedia
- Selection of implementation tools.

2.1 Important of arithmetic and IQ knowledge to children

Interactive Multimedia Learning Arithmetic and IQ is develop by applying interactive multimedia and hypertext. The system offer the leaner solutions their problem instead of teaching them about the course. It also measuring children's intelligence by giving them test in arithmetic and IQ. It is an interactive system, which apply the multimedia concept such as text, graphics, audio and animation to help content in an intelligent way. It is designed to model problem solving ability of human expert. The Interactive Multimedia Learning is an intelligent system for children to more understanding of arithmetic such as whole numbers and fraction and also about IQ knowledge.

Interactive Multimedia Learning may look like an intelligent tutoring system but instead of tutoring, it is also provides help materials to the learner. In order to teach and help effectively, the system must understand the current skills level and cognitive state of the learner who uses it. Psychology, education, cognitive science, artificial intelligence and human factors all play a role in the development of this system.

This system basically attempts to model one-to-one human help situation. This is because a one-to-one help is the 'Gold Standard' of learning. This is also can improve the children's capabilities in arithmetic and IQ.

2.2 The problem that children face in studying arithmetic

Base on the studies and observation that has been done, we get to know that many people now have difficulty in learning mathematics. The problem faced by children has been identify to overcome the problem and to find a alternative on how to increase the standard of learning arithmetic.

Some of the problems are :

(a) Children are bored reading books, this is one of the reason they are not interest in mathematics.

(b) Some people mind are fix that mathematics are a hard subject and they didn't take any incentive to over come the problem.

(c) Techniques that being used in school, fails to get the pupils interest in arithmetic. The student takes it as a hard subject and feels its burdening them.

(d) The student fails to understand the topic that has been thought. They also find its difficult to relate what they learn in real life.

2.3 Computer Assisted Learning (CAL)

Computer Assisted Learning or CAL refers to the use of computer as a learning resource to assist children in their tasks. CAL uses computer software, which facilitates teaching through interactive text, questions and responses from the computer to provide answer.

CAL is actually the delivering of instruction or the lesson or any educational material interface to package and later use for teaching, solving problems and making more interesting.

Although CAL cannot replace the role of a teacher, it is useful instrument that can make learning more fun and interesting. CAL applies the concept of multimedia to enhance learning and also teaching packages.

2.4 Human Computer Interaction (HCI)

The system should consider the interface design to provide an easy way of interaction between the user and system. Thus, it also must maintain simple and instinctive interface.

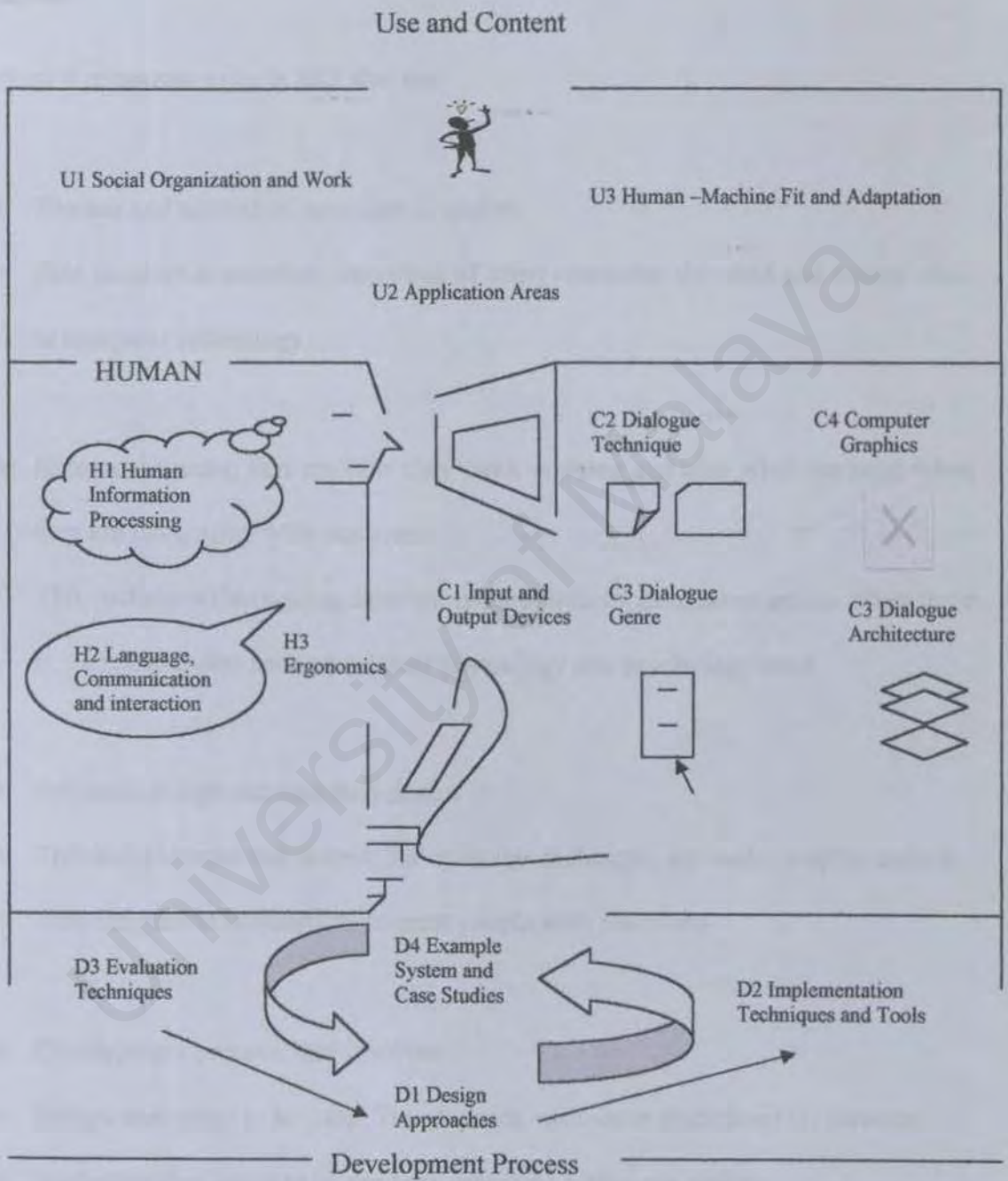


Figure 2.1 : Human Computer Interaction (HCI)

HCI is a discipline, which involve design, evolution and implementation integration of computer system for everyone's use. In this case, we have to consider surrounding phenomena.

There are 4 important topic in HCI that are :

a. The use and context of computer in society

- This involves conception, important of using computer, the need and society view in computer technology.

b. Human character, that are how they work or thing and also what the need when they are integrating with machines.

- This include understanding how we process information, taken action when there is a need, and also understand their physiology and psychology need

c. computer design and interface design

- This include input and output, dialog design technique, computer graphic and etc
- This component basically to connate people with machines.

d. Development process, that involves :

- Design that going to be used. This depends with some discipline that involves
- Technique that going to be used are prototype technique, and etc.

- Assessment technique, that to evaluate product, ability to learn, capability and etc. This can be achieving by using technique such as, interview, asking question and etc.

2.5. Multimedia

2.5.1. Definition Of Multimedia

Multimedia is more than one concurrent presentation medium (for example, on CD-ROM or a web site or live theater). Literally, multimedia means many media or multiple media. That is combination of two or more discrete medium (such as text, image) and continues medium (such as video and audio). Some people might say that the addition of animated images produces multimedia, but it has typically meant one of the following:

- Text and sound.
- Text, sound and animated graphic images.
- Text, sound and video images.
- Video and sound.
- Multiple display areas, images, or presentations presented concurrently.

2.5.2. Advantages of Multimedia

- Mirrors the way in which human mind thinks, learns and remembers by moving easily from word to images to sound, stopping along the way for interpretation, analysis and in depth exploration.
- The combination of media element in a multimedia lesson enable learners to learn more spontaneously and naturally, using whatever sensory mates the prefer.
- Combining media elements with well-designed, interactive exercise enable learns to extend their experience to discover on their own, so that they are no longer passive while information is 'Fed' to them.
- By combining words with pictures, graphics and audio, multimedia programs enable people with varying levels of literacy and math skills to learn by using sight, hearing and touch.
- Furthermore, from the results or survey done by Commodore that human get their information in the following way :
    - More than 80% by sight-of which 20% is remembered.
    - 11% by hearing-of which 30% is remembered.
    - 3.5% by smell.
    - 1.5% by touches and taste.

Where 50% of what is both seen and heard is remembered and 80% of what is seen, heard and done, is remembered

2.5.3. Disadvantages Of Multimedia

Multimedia system however has some disadvantages:

- Need high processor speed, memory, disk space and date throughput.
- Those elements like sound, images or animation and video need higher bandwidth than text files because of the size.
- The implementing of this system is complicated.
- It requires larger storage devices.
- It requires additional hardware and software, which is expensive and involve high cost of the development stage.

2.5.4. Interactive Multimedia

The multimedia component is combination of media, which includes text illustrations, photographs, audio, graphics, images, voice and animation. Interactive element can include voice command, mouse manipulation, text entry, touch screen, video capture at the user, or live participation (in live presentations). Interactive multimedia consists of material, which are both multimedia and hypermedia. Interactive multimedia engages the user by allowing them to make choices such as a clicking to activated and audio, click and dragging to match objects or clicking a button to navigate.

Within an education, interactive multimedia can be use as an instructional aid, interactive tutorials and references work. Interactive Multimedia Learning Arithmetic and IQ skills

will present the learner with choices of lesson and the choice taken by the learner will influence the path of system follows.

2.5.5. Hypermedia

Hypermedia is a combination of hypertext and multimedia element such as images, audio, and video. It is the software that utilizes linked media. It also offers much to learner inters of providing an environment that engages the learner. Hypermedia consists of 3 level :

- Read only hypermedia
- Participatory hypermedia
- Exploratory hypermedia

2.5.6 Hypertext

Hypertext is non-linear text which contains connections called hyperlinks, hot word or hot links to other documents. It is the same as regular text where it can be stored, read, searched or edited. Within education, hypertext has been seen as a new valuable new constructivist tool for supporting teaching and learning. The two major components of hypertext documents are the nodes and the links. Nodes are the primary elements of information. The size of nodes can be text or a combination of images, sounds and video.

The links was function to tie the nodes together. It associates the nodes with regards to their semantic relationship.

2.6 Selection of implementation tools

In order of develop the system, an investigation is done to select appropriate software. The development tools that will use for develop this system is programming tool, Active Server Page(ASP) and multimedia authoring tool, Director 8.5. There are several critical areas to consider a development tool for Interactive Multimedia Learning Arithmetic and IQ skills. The following aspects were considered :

1. Authoring environment
2. Price
3. Support for text, graphics, animation and sound
4. Extensible architecture
5. Multimedia application environment

2.6.1. Authoring Environment

The authoring environment is one of the most important areas of consideration. Typically authoring environment come in two varieties which are those icon-based with drag and drop flow charting and those which one object oriented which requires scripting. Scripting tools are often better suited to developer familiars with traditional programming in order to produce a good system. For the computer based lessons and tutorials that are being developed, an important consideration is the flexibility of the tool interactivity.

This interactive learning package requires the object oriented and scripting authoring environment to produce a powerful system. Most of the function in the system such as animation problem solution, practice question and IQ question requires scripting to run it. This environment allows the implementation of these functions in the system.

2.6.2. Price

The hardware requirements of the computer system being used for development will be determined by the sophistication of the application being developed. If the full range of multimedia types, (such as images, sound, animations and movies) is to be included, it is more costly because an additional capable machines is required.

This aspect should be considered because the thesis requires several multimedia captures to be implement such as sounds, images, animation and graphics.

These components may require the additional hardware, which is costly for the developer. A cheaper priced multimedia-authoring tool is considered to allow the system to be used by the target user.

2.6.3. Support for text, graphics, animation and sounds

The authoring tools must be able to handle text, graphic, animation and sound. Hypertext and equation editing capabilities may also be necessary. The development tool must also be able to handle file formats of the media being used in the application.

These tools are required to support the thesis functions as a multimedia system and learning package in interacting with the user. Otherwise, most of the system features cannot be implement.

2.6.4 Extensible Architecture

The multimedia tool must have an extensible architecture to perform the tasks such as Dynamic Link (DLE) Dynamic Data Exchanges (DDE), object linking and embedding (OLE in windows Environment.)

2.6.5. Multimedia Application Environment

Based on the application to be developed, information to be conveyed, the user that will use the system and the quantity of interaction between the application and the user, and appropriated multimedia development and the user, and appropriated multimedia development areas were evaluated. There are there typical multimedia application areas :

a) Text-based applications

b) Interactive Applications

c) Wide area Applications

Chapter 3 : Methodology

3.0 Methodology

The waterfall model with prototyping has been chosen as the system process model. The waterfall model is a model that is divided into a few distinguished stages, offering visibility of each process. The model can be divided into six stages.

There are :

a) Requirement definition

b) System and software design

c) Prototyping

d) Implementation and unit testing

e) Integration and system testing

f) Operation and maintenance

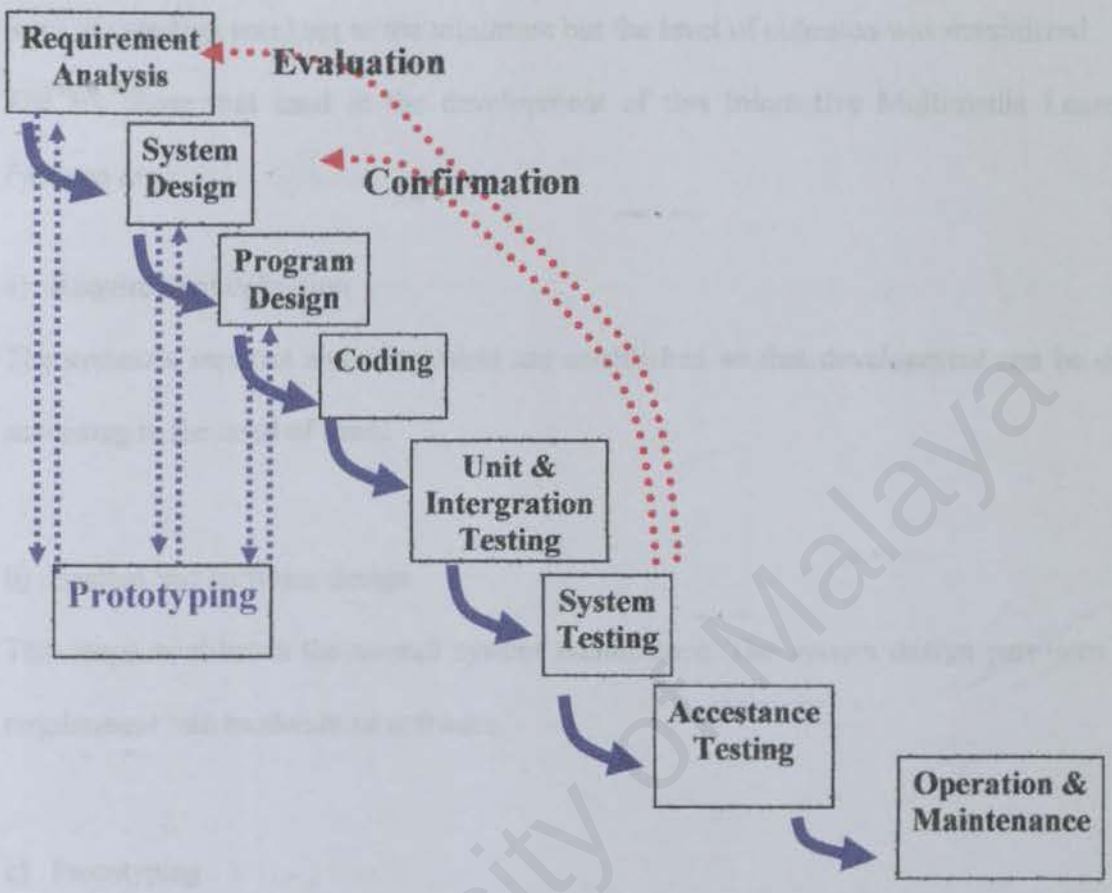


figure 3.1 : Model WaterFall With Prototyping

A combination of top-down structure and prototyping approach was used in the coding phase. The concepts of modularity and partition of the system modules was applied. The level of coupling was kept to the minimum but the level of cohesion was maximized.

The six phase that used in the development of this Interactive Multimedia Learning Package are :

a) Requirement definition

The system's services and constraints are established so that development can be done according to the need of users.

b) System and software design

This stage establishes the overall system architecture. The system design partitions the requirement into hardware or software.

c) Prototyping

Prototyping is a process to come up with a rapid system for the purpose to validate the use requirement.

d) Implementation and unit testing

The program or components of the system are tested individually. Unit testing involves verifying that each unit meets the specification.

e) Integration and system testing

The units that were tested is then integrated and tested as a whole system. After testing, the software can be use delivered to users.

f) Operation and maintenance

This is the part when the system that is put into use will have errors in it. Maintenance involves correcting these errors, which were not discovered earlier and improvement to the system can be done.

The stages do actually overlap and feed information to each other. The software process in non linear but actually involves a sequence of iterations of the development activities until the final system is develops.

3.1 Prototyping Requirement

There are sometimes when we are uncertain or exactly what is required or needed. The requirement analysis may yield a 'wish list' of what the users would like to see, but it is not clear whether the list is complete. In other cases, users know is needed or wanted, but we are not certain whether the user's problem has a feasible solution. There are two approaches to prototyping :

a) Throw-away Prototype

A throw-away prototype is software developed to learn more about problem or explore the feasibility or desirability of possible solution. It is exploratory and not intended to be used as an actual part of the delivered software.

b) Evolutionary Prototype

An evolutionary prototype is developed to learn about the existing problems and form the basis for some or all the delivered software. For example, several evolutionary prototypes can be built to let the users, who are not certain about what they want, to choose the preferable options. If one interface is chosen, the prototype can be developed into the actual interface and delivered the rest of the product.

Both of the mentioned techniques are sometimes called rapid prototyping because they build sections of the proposed system to determine necessity, the desirability or feasibility of requirement. The term " rapid " distinguishes the prototyping from that used in engineering, where a small system or a subsystem is built, after the design is complete. In rapid prototyping, choices are evaluated before design is crated, the purpose of the rapid prototyping is to help us understand and design on a successful final design.

3.2 Requirement Analysis

This is the first phase in the development model and its start with gathering and collecting system's requirement. At this phase, developer will keep intact with users or target users to define the overall objectives for the system, identify the requirement and specify the layout and scope of the system.

3.2.1 Functional Requirement

A functional requirement describe an interaction between the system and its environment. It also describe how the system should be have given certain stimuli. As mentioned earlier, Interactive Multimedia Learning Arithmetic and IQ is divided into two main modules in children module. That is :

1) Learning Arithmetic module
2) IQ Test module

The functional requirements of this package are as below :

Interesting

Children will be more interested to learn arithmetic. The learning sessions should be easy to be learned and understood by the user in a short period. An animation will be added in order to make the sub system interesting and guideline to learn arithmetic will be

provided. The appropriate way to convey learning material is through audio and animation. Illustration, diagram and pictures will be described and gave a clear explanation.

Learning Module

This module provides main four topic to the user to learn arithmetic in a short period. The user can choose the topics they prefer by clicking the "Topics Selection" button provided. Some special functions such as pictures, animations, sound, and arithmetic interface will be also provided in this package. This module provides the 'NEXT' and " PREVIOUS" button to allow user to view the next and previous pages and exit button.

Quiz Module

This module provides tutorial questions to the user to evaluate their abilities and test their understanding in what they have learn in the previous topic. Answer also provided to ensure that the users obtain the correct answer while they are doing the calculation for each Quiz.

Test Module

This module provides arithmetic test to the user to test their capability solving arithmetic problem with timing. The user can get their result by the time they finished their test.

IQ Test Module

This module provides IQ test to the user to test their IQ knowledge level and can get their result by the time they finished their test. The answer for this IQ test also provided.

3.2.2 Non-functional Requirement

Nonfunctional Requirements is a description of the features, characteristics, and attributes of a system as well as any constraints that may limit the boundaries of the proposed solutions Nonfunctional requirements of this package are as below:

Efficiency

A computer terminology means a process or a produce that can be called or accessed in an unlimited number of times to produce similar outcomes or output at a creditable pace or speed. Foe example, the quiz and exercise can produce as many questions at many times when requested.

Understandability

In terms of the coding method, allows other programmers to understand the logic of the programs flows, thus changes can be made easily upon the necessary program segments without modifying other essential logic of the program. Simple and clear sentences are displayed so that the use can use the system without any difficulties.

User friendly

Most of the multimedia packages establish this feature through the usage of the click of a mouse and visualizing mouse icon. The mouse icon provides the program with easy access to custom cursors of any size with any desired hot spot location. The system is required to have a very user-friendly interface because most of the users are children, who are non-technical users. The designing of the screens are included as below:

- Attractive background colors and pictures.
- Topics are described in short notes
- Main menu allows the user to go to other sections such as other lessons, exercises and etc
- Provides animations pictures to help user to understand these package quickly and easier

Effective

The forms are presented with colorful background, animation, audio, video and visual illustrators. Colorful background will give clearer and attractive view. Audio will draw the user attention.

Reliability

The system must be made stable on the target operating system specifications. A system is said reliable if it does not produce dangerous or costly failures when it is used in a reasonable manner, that is in a manner that a typical user expects is normal. This definition recognizes that a system may not always use in the ways that the designer

expects. This learning package is reliable system cause all the possible failure and errors, which could are taken under considerations

3.3 Information gathering

3.3.1The Fact-Finding Technique

The fact-finding technique is the specific method for collecting data and relevant information pertaining to system requirement. There were four method used to collect data information on the requirement. There were survey and Observation, Questionnaire, Using the Internet, Research on books, Magazines and Journal, guidance from the lecturer and the Document room in faculty of Computer Science and Information Technology.

a) Survey and observation

A survey was done to find the existing Interactive Multimedia learning system existing in the market

b) Questionnaire

The main objective of carrying this activity is to obtain general information on consumer reaction and interest on arithmetic and IQ text and also what are the advantages and disadvantages that they gained while surfing this sites. Questions were simple and easy to understand by all ages.

c) Using the Internet

The internet search engine that I commonly used were :

i http://www.askme.com

ii http://www.yahoo.com

iii. http://www.altavistra.com

iv. http://www.hotmail.com

v. http://www.geogle.com

All the search engine was used to search was used to search for information specific keywords based on the type of information needed was used to search the necessary information. Below are the details or the sites visited :

Site on interactive Multimedia :

(a) http://www.gergetown.edu/crosroads/multimedia.html.

This sites provides all the information about interactive multimedia, why is it used, and the type of multimedia available. It also explain how multimedia can be incorporated into education context and technical requirement for using multimedia.

Sites on Web and Interactive designing:

(a) http://tutorials.beginners.co.uk/view/cobrand/search_middleware/i/t

This site provides useful tutorials authoring tools such as macromedia Flash, Macromedia Director, Microsoft FrontPage, and so on. It also provide tutorials on HTML, ASP (Active Server Page), VD, the internet, CD-ROM and web development, web and CD-ROM marketing etc.

(b) http://wwwmacromedia.com

This site was surfed to get information about design and development tools such as macromedia flash 5.0 and flash MX, macromedia Director 8.0, etc.

(c) http://www.abode.com

This site provides the information about web design tools such as Adobe Illustrator, Abode PhotoShop, Abode Premiere, and so on. Even though this are more web based designing, but it can also be incorporated into a CD-ROM based designing. The main difference between CD-ROM learning and web based learning is the linkage.

Research on books, magazines and Journal

There were various books to gather information. Basically these book were used to gather more information on arithmetic, IQ knowledge and text, and also about Asp (Active Server Page.) Research was done to prepare the learning modules for this thesis. Other tools were also used to learn more an authoring tools and their stage. Some of the titles of the books.

d) Guidance from the lecturer

Discussion with the lecturer was done along the process of preparing this proposal to ensure that the content of the system proposed is accurate and relevant. Helpful tips on how to gather information were given by the lecturer. The lecturer also gave opinions and advice regarding the system design of Interactive Multimedia Learning Arithmetic and IQ.

e) Document Room

Another source of gathering information is the Document Room which is located in the faculty of Computer and Science and Information Technology University Malaya. Here some documentation by other student final year thesis that were done in the part years can be found. Some of this documentation were found relevant in providing information in developing this software. The documentation actually gives a brief idea an how to go about in developing a system from the beginning, which is rather important in the developing this learning package.

3.4 Software Requirement

- **Active Server Page (ASP)**
- **Macromedia Director 8.0**
- **Macromedia Flash 5.0**
- **Adobe Photoshop 6.0**
- **Xara 3D Max**
- **Microsoft FrontPage**

- **HyperText Markup Language (HTML)**

3.4.1 ASP (Active Server Page)

Active Server Page (ASP), which enable Hypertext mark-up language (HTML) authors and web developers to mix HTML and inline scripting using almost any authoring tools. The script can reference component running on the local server, or any other server to access database, application or process information. When the browser requests an ASP file, it is processed by the server and the page is returned to the client as standard HTML.

An ASP application is comprised of various item that together from the ASP application. The collection consist of (SKD 97) various text-based files, server object and component and Active Server Scripting as shown below :

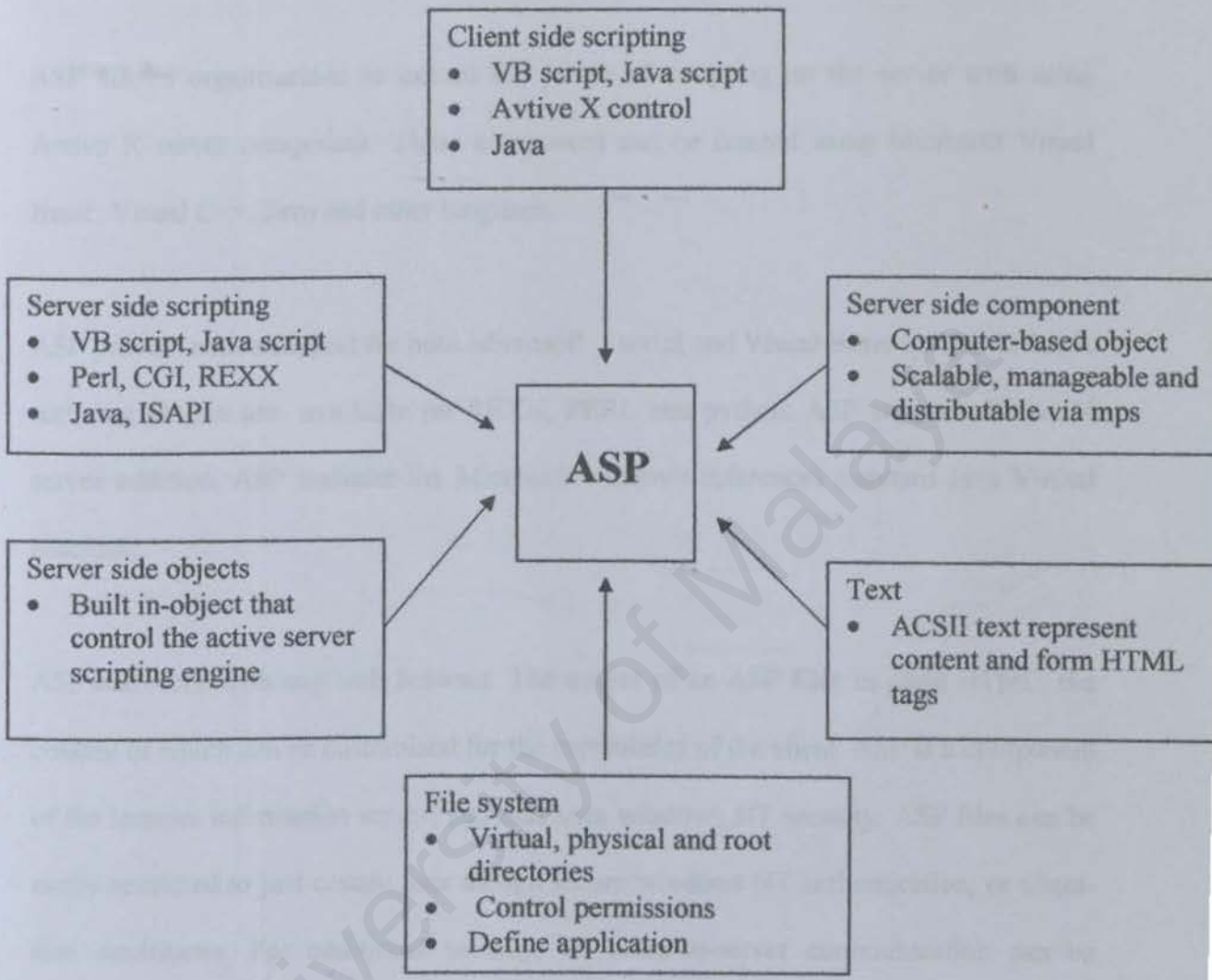


Table 3.1 : Active Server Page (ASP)

ASP can develop a new generation of web-based application, including extending sales and customer service to the web, and providing access to corporate databases and

application to any browsers on a internet. ASP makes it easy to bring legacy database application to the web.

ASP allows organizations to extend the power of scripting on the server with using Active X server component. These component can be created using Microsoft Visual Basic, Visual C++, Java and other language.

ASP provide native support for both Microsoft J script and Visual Basic Script. Active X scripting plug-in are available for REXX, PERL and python. ASP supports Active X serves addition, ASP includes the Microsoft windows references standard Java Virtual Machine.

ASP can work with any web browser. The output of an ASP files in plain HTML, the content of which can be customized for the capabilities of the client. ASP is a component of the internet information server, and thus uses windows NT security. ASP files can be easily restricted to just certain user though secure windows NT authentication, or client-side certificates. For additional security, all client-to-server communication can be secured with Secure Sockets Layer (SSL).

An ASP application can integrate with any ADBC-compliant databases and DB 2 databases. Any OLE 2 application, such as Lotus Notes or Microsoft Excel, can also write components to access or process information. Programmers can be also write components to access online data feeds and legacy mainframe.

ASP provides all of the functionality of CGI applications in a easier to use and more robust environment. ASP is an easier way for user's server to access information in a form not readable by the client (such as an SQL database) and then act as a gateway between the two to produce information that the client can view and use. ASP runs in the some process as the web server, handling client requests faster and more efficiently. It is much easier to develop dynamic content and web application with ASP.

3.4.2 Macromedia Director 8.0

Macromedia Director 8.0 is of the most common authoring tools. Originally for Macs, it is now available of a theatre, based platform. Director uses the metaphor of a theatre, with a 'stage' and a 'cost' of object. Director is less powerful than Authorware or Toolbook as it is less of a programming environment, but it is worth considering for highly graphical computer-assisted learning-package with straight forward interactions. Animation capabilities are very good.

3.4.3 Macromedia Flash 5.0

Macromedia flash 5.0 allows to create a web experience that is more attractive, more compelling, and compatible with more browsers than with any other web solution. Dynamic HTML (DHTML), Java, and other advanced web design web formats are not reliable alternatives, since they are either compatible or inconsistent with different browsers. With Macromedia Flash 5.0 Players pervasive penetration, wide availability,

scalable vectors, animation, sound and more. Macromedia Flash provide the high production quality that attracts users and more the impressed. Macromedia flash is light weight and powerful, macromedia's flash help solve the bandwidth dilemma faced by user or developers. Site use this technology to create buttons and controls that give animated feedback which will make the production more interesting.

3.4.4 Adobe PhotoShop 6.0

Adobe PhotoShop 6.0 software introduces the next generation of image editing with powerful new features that offer something for every uses. Delivering the broadest and most productive toolset available, Photoshop helps you explore your creativity, work at peak efficiency and achieve the highest quality results across all media Abode Photoshop 6.0 software introduces the next generation of image. Editing capabilities with powerful new features that something in every user.

It can :

- Expand Beyond pixels.

Photoshop 6.0 redefines traditional images editing with integrated vector drawing tool and new layer design features that greatly enhance your creative options.

- Produce superb Graphics

Photoshop 6.0 expands its web toolkit to provide more timesaving, production oriented features including Abode Image Ready 3.0 for advanced multimedia production.

- Master the power of Photoshop quickly

Photoshop 6.0 is designed to make it faster and easier for everyone to get to work and its comprehensive toolset more fully.

3.4.5 Xara 3D Max

Xara3D is a 'slimware' program as opposed to the increasingly complex 'bloatware' that is released from the major software developers nowadays. This does not mean that Xara3D is low quality or produces inferior results compared to more complex 3D programs; on the contrary, it produces better output, and faster than just about anything else.

'Bloatware', while often very capable, includes so many features that most people never get to use more than 10% of the functionality. It's often huge, impractical to download over the Internet, requires huge amounts of disc space, and is nearly always so complex that to use its advanced features takes a considerable learning effort.

Xara3D is designed to be a program that does one thing, and does it supremely well, that is dead simple to use, and costs very little. It's designed to be small enough to be easily downloaded from the Internet.

Xara3D produces high quality three-dimensional images and nothing else. These images would typically be used on Web pages although they can be used anywhere. Xara3D can

create animated 3D images with absolute ease (AVI movie or GIF). You have control over the text, the font, the depth of the 3D extrude, the type of the bevel on the edges and the lighting. You can position and rotate the 3D objects just by dragging, and it updates the image in real-time, interactively. You resize the image just by resizing the window. It couldn't be easier.

3.4.6 Microsoft Front Page

The Microsoft FrontPage is a tool that can be used as a web site creation and management tools gives everything that is need to create and manage exactly the site whatever creating a personal web page or corporate Internet or Internet site. It is easy to use and provides good result. It allows you to inset graphics, create tables, form and either advanced HTML features, in a intuitive fashion. It gives you a graphical overview of your website, showing links between all you document and installs your own personal server.

3.4.7 HyperText Markup Language (HTML)

Hypertext Markup Language (HTML) is the language specify the construction of web pages. Web pages are a form of hypertext and include text, graphic and lines to other HTML documents.

Web pages are stored as standard ASC11 (American Standard Code for Information Interchange) files. Web page may be viewed by a variety of different web browsing tools,

each may have different abilities. However, since web pages are text files, each web browser can read it and format the document in an accordance with its abilities.

HTML is a standard which enables you to request a web browser to format and display your web page in a particular way. HTML allows you to moork areas of your document that will become for example: titles, new paragraph, or italic text. Since the web page is specified as an ASCII files the codes or "elements" have also to be ASCLL.

The elements can broadly be divided into two main categories: those that describe the format of the web document, i.e what its look like, and those that define information about the document.

3.5 Hardware Requirement

- Pc
- 32 MB RAM
- Monitor
- CD Writer
- Speaker
- 16 bit sound card
- 100 MB disk space
- CD- ROM drive

3.6 Comparison Between Existing System

3.6.1 Aloha Mental Arithmetic

Figure 3.2 : Aloha Mental Arithmetic

Advantages :

- Aloha mental arithmetic is one of the system learning arithmetic and increase users solving skills in arithmetic.

- form of training that enhances a child's ability to calculate without the aid of any instruments

3.6.2 MathWork Worksheets

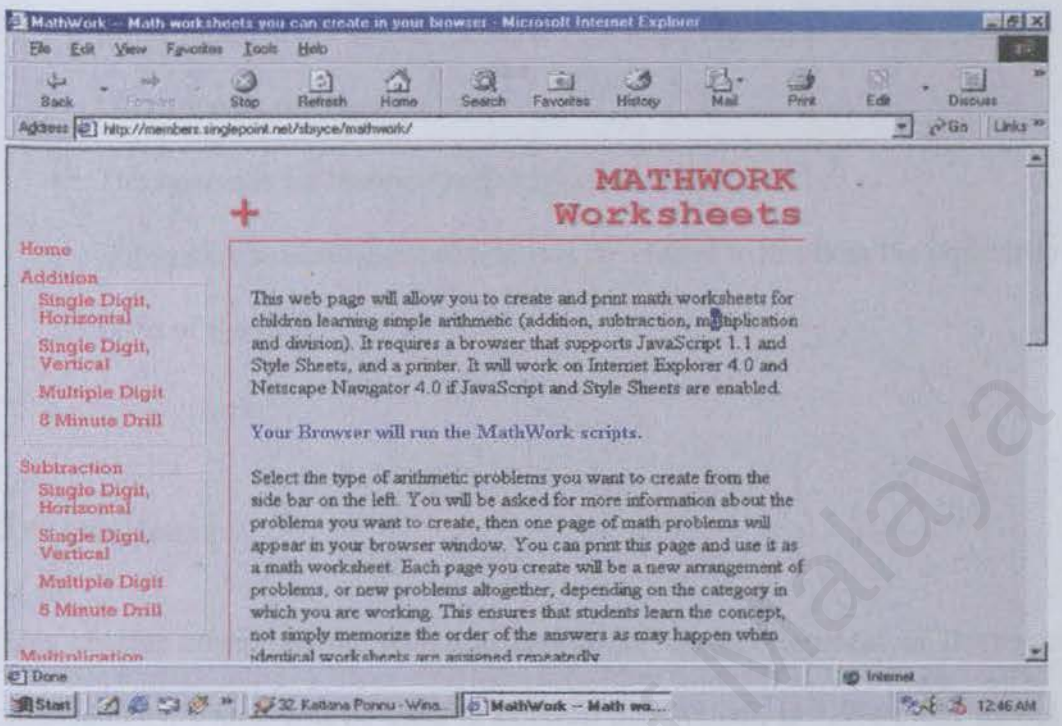


Figure 3.3 : Mathwork Worksheets

Advantages :

- Mathwork Worksheet is for children learning simple arithmetic as addition, subtraction multiplication and division.
- It has a lot of practice question and a simple test in each topic.

Disadvantages of Mathwork Worksheet and Aloha Mental Arithmetic:

- Less animation in this system
- Interface are not attractive
- Children only can learn arithmetic by both this system

3.7 Advantages of Interaction Multimedia Learning Arithmetic and IQ

- More animation in system, children will more interest to use the system
- User friendly interface
- The system is for learning both arithmetic and IQ Test.
- The system is beneficial because it is developed to test both the arithmetic and IQ skills of the user.

3.8 Conclusion

This chapter covers all the technical aspects of the development of this system. The methodology, which will be used to develop this system, is " Waterfall Model ". The waterfall model is a model that is divided into a few distinguished stages, offering visibility of each process. Nonfunctional and functional requirements are also discussed to give a brief idea to the designer to know the users requirements and come up with a better system. In short, system analysis plays an important role in the development of a system.

System Design

Chapter 4: System Design

4.0 What is System Design?

System design [1] build on the knowledge obtained from analysis phase, it uses the requirements to design a system that will meet the users needs. Design phase focuses both on the logical and physical or technical aspects of the system. Using the information obtained from the system analysis phase, the designers propose a new system that will solve the users' processing problems or meet their current and future needs. The design phase synthesizes the various parts into a viable, working system. The design will include database, function or process and other dynamic aspects of the system. The design will also specify how the various functions will be integrated as well as the input/ output design and interface design.

The objective of this chapter is to discuss about the system design of learning package for visual basic. This will be divided into:

- System Architecture
- Data Flow Diagrams
- System Interface

[1] Dr. P. Sellapan, Software Engineering: Management and Methods, 1st Edition : Sejana Publishing , 2000, pg 9-1.

4.1 System Architecture

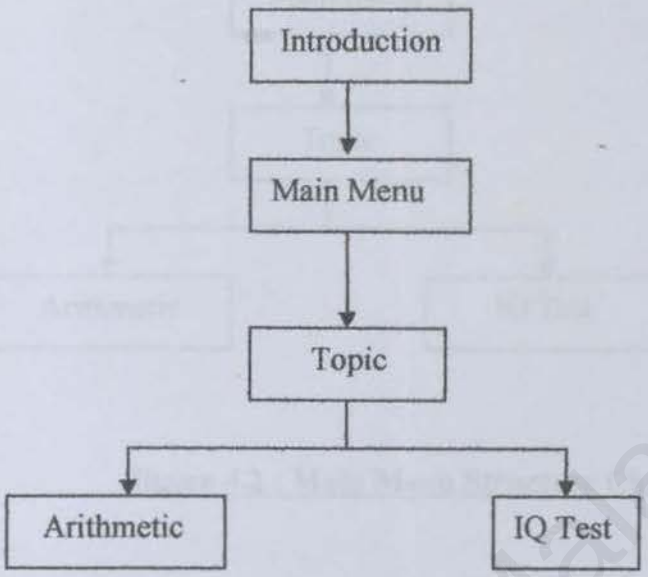


Figure 4.1 : Main System Structure Chart

The system is divided into 6 main modules which is :

- Introduction Module
- Main Menu Module
- Topic Module
- Arithmetic Module
- IQ Module

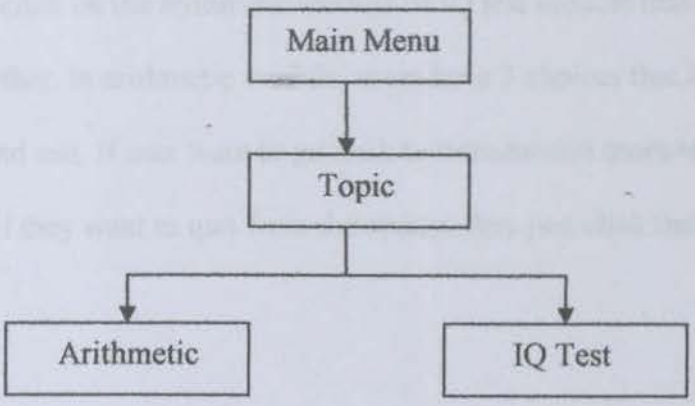


figure 4.2 : Main Menu Structure Chart

When user click the icon main menu in introduction module, you will link to main menu module. Users just have to click on the topic module that they to revise and proceed with it further. If user want to go back to introduction module they can click the back icon. Or if they want to quit from the system they just click the exit icon.

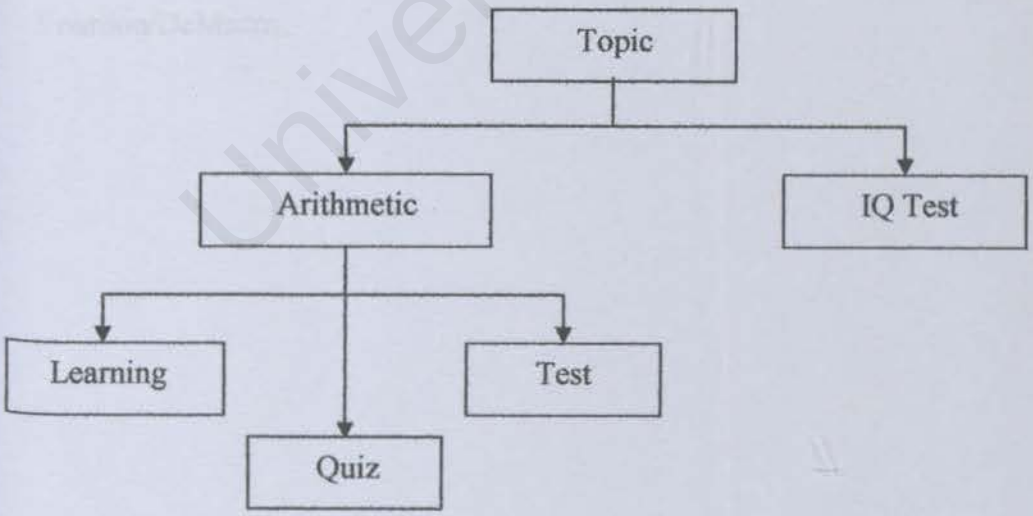


Figure 4.3 : Children Module Structure Chart

When user click the icon Topic in main menu module, you will link to topic module. Users just have to click on the arithmetic module or IQ test module that they to revise and proceed with it further. In arithmetic module, users have 3 choices that is learning arithmetic, quiz, and test. If user want to go back to introduction module they can click the back icon. Or if they want to quit from the system they just click the exit icon.

4.2 Data Flow Diagrams

A Data Flow Diagram (DFD) is a technique used to show graphically the flow of data through a business system and process performed by the system. The DFD gives an overview of system inputs and outputs, process and the flow of data through each process. DFD is drawn using four basic symbols to represent processes, process, data flows, data process and external entities. Different authors use different symbol. Figure below shows one of the most commonly used notations for DFDs created by Yourdon/DeMacro..

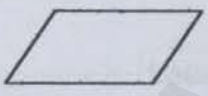
Symbol Name	Yourdon/DeMarco
Process	
Data flow	
Data process	
Entity	

Table 4.1 : DFD's four basic symbols to represent processes

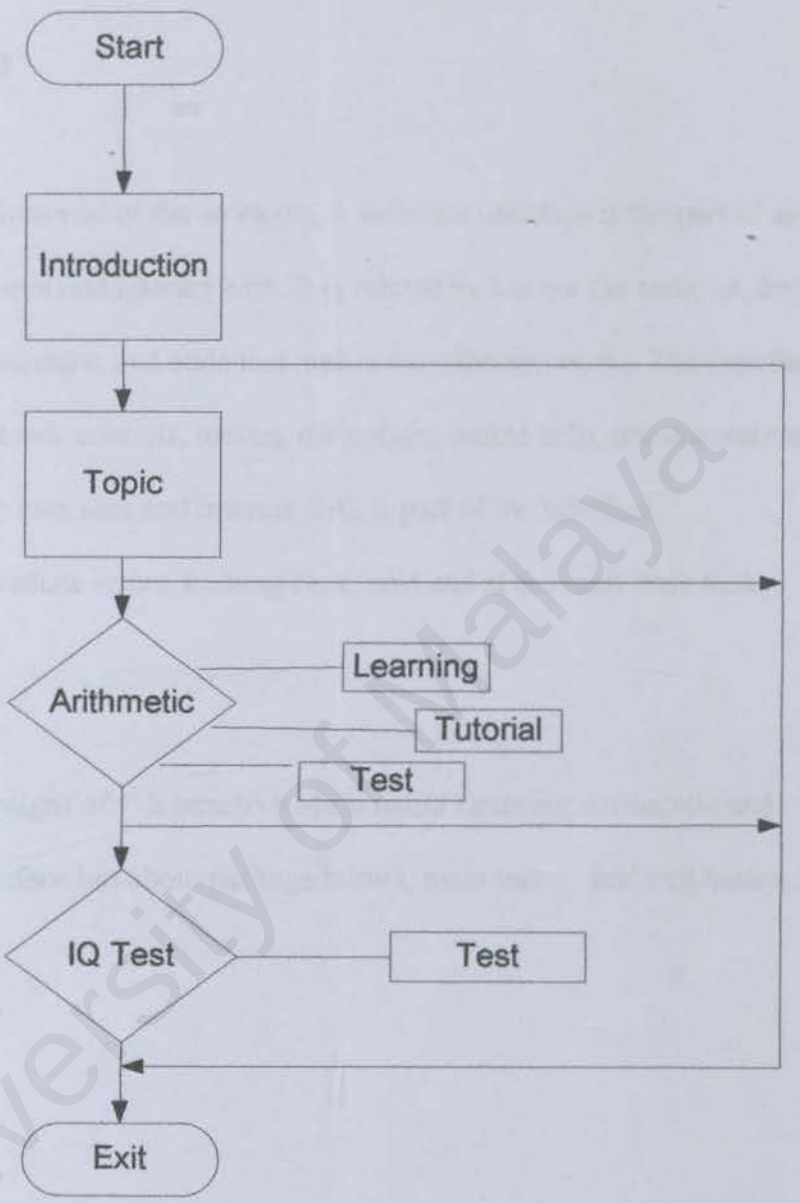


Figure 4.4 : System Data Flow Diagram

4.3 System Interface

4.3.1 What is Interface?

The user interface is the front-end of the software. A software interface is the part of an application that the users sees and interact with. It is related to, but not the same as, the underlying structure, architecture, and code that makes the software works. The interface includes the screens, windows, controls, menus, metaphors, online help, documentation and training. Anything the uses sees and interact with is part of the interface.
Well-designed interfaces reduce errors, training time, cost and at the same time make people more productive

Below are the interface designs of " Interactive Multimedia Learning Arithmetic and IQ". The introduction interface has about package button, main menu, and exit button.

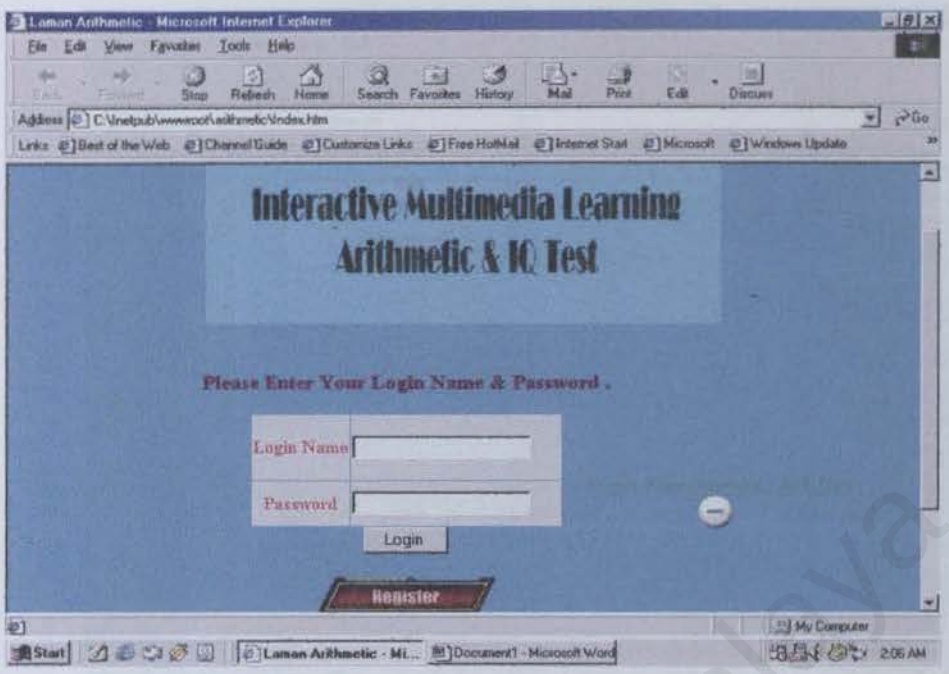


figure 4.5 : System Introduction Interface

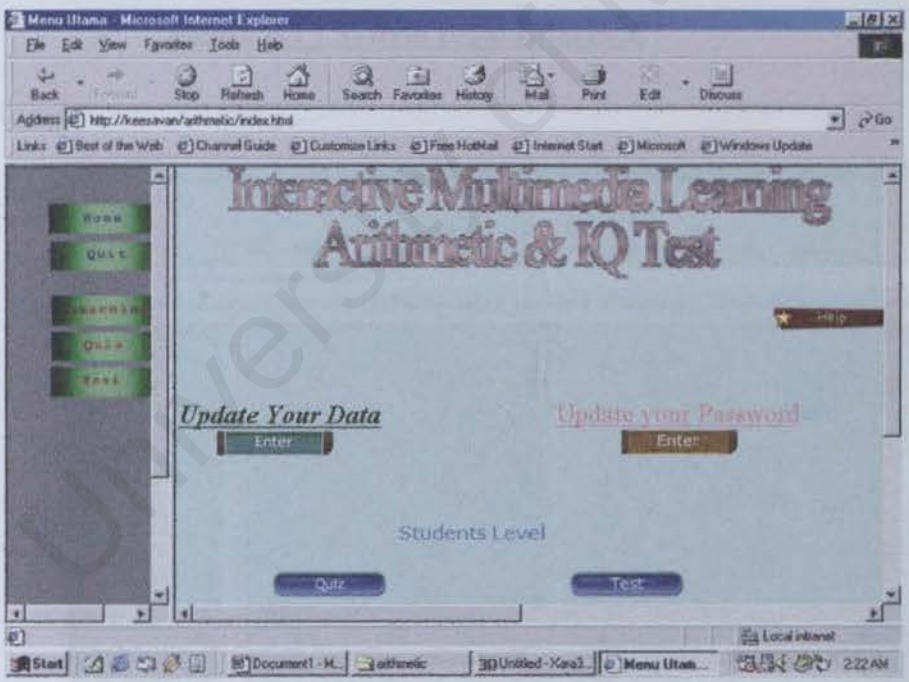


figure 4.6 ; System Main Menu Interface

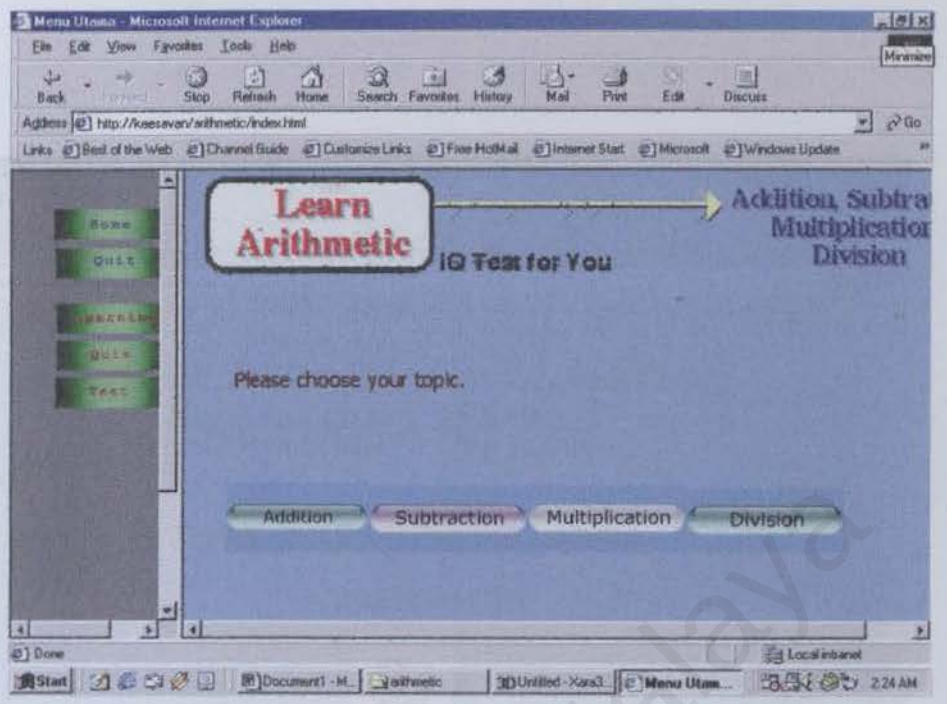


Figure 4.7 : System topic Interface

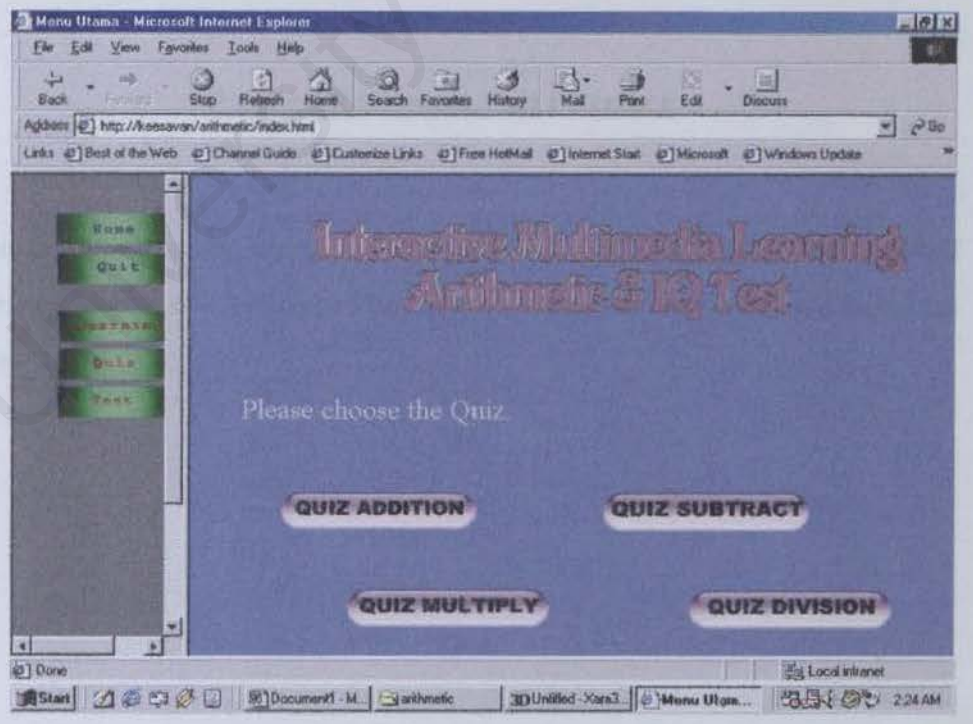


figure 4.8 system arithmetic interface

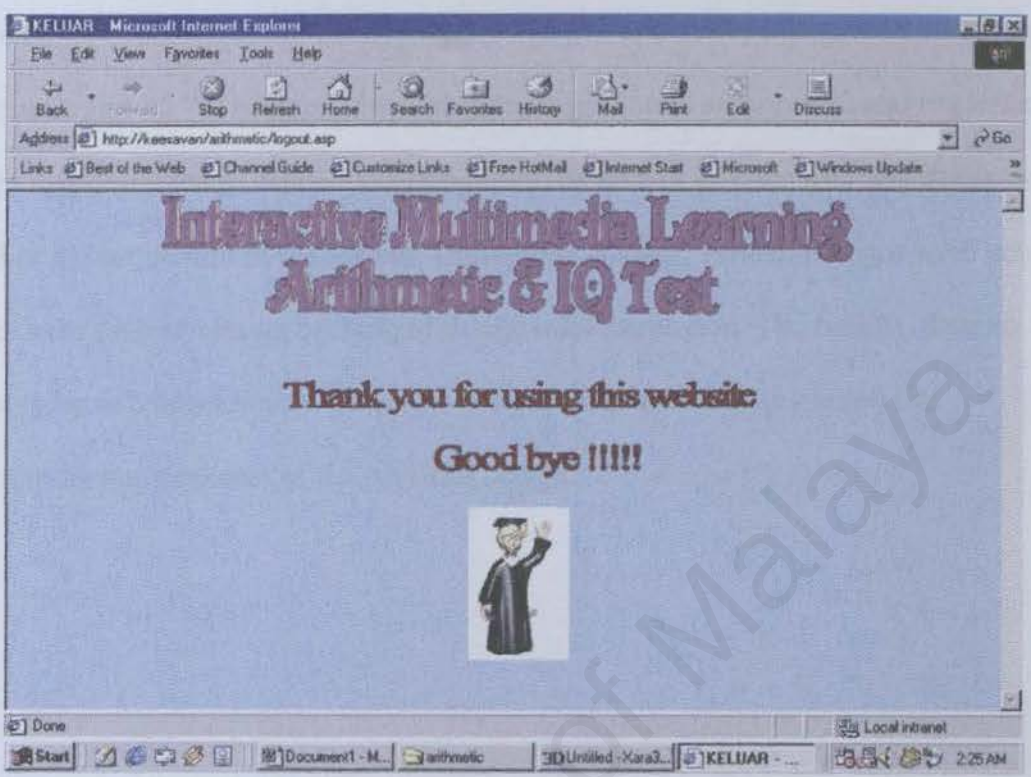


Figure 4.9 : System Exit Interface

This very important in designing a system, because if the user accidentally click the exit button, the message above will be popped out to ensure that the user really wants to quit from the system.

4.4 Conclusion

This chapter concentrates on the System Design of "Interactive Multimedia Learning Arithmetic and IQ ". The overview of this package system architecture and interface design was described in detail. This design will be able to give the user and developer in detail or a clear picture of the system. During this chapter, various changes were been made to the original design because of design implementation. The benefit of using prototyping as a development paradigm made it clear and was very helpful in determining the weakness of the previous design.

Chapter 5 : System Implementation

5.0 Overview System Implementation

Since the waterfall model with prototyping approach was applied in developing the Interactive Multimedia Learning Arithmetic and IQ Test for children between 8 to 11 years old, it generates many iterative steps that involve mostly the implementing and testing phase. The word ***implementing*** referring to the development of a working model. It is also the process that convert the system requirement and designs into program codes.

In this phase, most of the work is done on coding and debugging. Here, various tools are used for developing this system. Programming language features and method of implementing those codes can profoundly affect the system quality and maintainability. Software and programming tools used for development will be discussed later in the chapter. Debugging techniques and its explanation are discussed in Chapter 6.

5.1 Implementation of Interactive Learning Arithmetic & IQ Test

Interactive Multimedia Learning Arithmetic considered to be a web application which have learning and test through a web server and is browsed with a web browser. Therefore, all the forms and information are generated and coded into HyperText Markup Language (HTML) before being presented to the browser. Languages used to develop

document that invoke the database views and document links in access database are HTML and ASP.

The coding of HTML document involves repetitious cycle of testing and modifying the HTML source codes, open the code in the browser for viewing and amendment are made for further improvement. These techniques are used because the debugger is not available for debugging HTML codes and changes could only be made if the output is unexpected in the web browser.

5.2 Development Environment

Development environment such as software and hardware used affects the development of a system. The duration of system development phase can be improved by using the appropriate software and hardware.

5.2.1 Software used for development

Microsoft FrontPage 5.0	To compose web pages
ASP Coding	To run the system
Internet Explorer 4.0/5.0	To view web pages
Microsoft Notepad	To create and modify all the HTML document and the coding used in the web pages
WWW Gif Animator	To create animated GIF files for web pages
Adobe Photoshop 6.0	To manipulates the scanned images and resizing the images to suit the web pages
Macromedia Dreamweaver	To create navigation buttons and to create and also design graphics for web pages besides creating some effects on the images
Microsoft Access 2000	To build a relational database to store and manipulate data
MP3 Decoder	To decode sounds from MP3 format to WAV format
Microsoft Word 2000	To write the system documentation
WinZip	To zip and unzip large files that need to be moved between different locations

Table 5.1 Software Used for Development

5.2.2 Hardware used for development

1. Personal computer with Pentium III processor
2. Microsoft Windows 98 operating system
3. Pc Partner Mother Board
4. 32 MB of RAM
5. 40 GB Hard Disk
6. Super VGA higher resolution video adapter (Super VGA, 256-color display Monitor)
7. 1.44 MB Floppy Driver
8. Mini Scroll Mouse
9. Standard Windows 98 Keyboard
10. 400 watt Multimedia Speaker
11. Hewlet Packard 400 Deskjet Colour Printer

5.3 Web Pages Development

Languages used to develop the web pages are the common HyperText MarkUp Language (HTML), JavaScript and VB Script. HTML is the basic language to create the settings and content of web pages, whereas JavaScripts is used mainly creating animation graphics and images. Besides that, VB Scripts plays an important role in developing the Active Server Pages (ASP) that integrates with the databases and to create the connection between databases and interfaces.

Preparation of document in HTML involves an endless cycle of modifying and manipulating the HTML source until the desired layout of the web pages had been achieved. This was managed in Microsoft Notepad text editor in Windows 98.

Images, graphics and navigation buttons were created using the software listed in the previous table and some of them also were obtained or adopted from other existing web sites that provides graphics resources. Some images and graphics looped animation files were created by assembling the related images and graphics into one single file using the WWW Gif Animator.

5.4 Databases Development

The database was formulated using Microsoft Access 2000. It is a relational database with some normalization applied on the related tables. Field types and lengths are specified according to functional requirement logic. The utilities provides by Microsoft Access 2000 were used to create the tables, queries, views and relationship among tables.

5.5 Integration Process

When the browser request for a file through the Personal Web Server of Windows 98, the file will be sent to display at the web browser. If multi users accessed the files, then the integration process between the browser and the server will take sometime and the loading of the pages or files will be slow.

5.6 Coding

Coding phase of Interactive Multimedia Learning Arithmetic and IQ Test consume most of the system development schedule time. But the facilities provides by Microsoft Front Page 2000, this phases was comfortably succeeded. Besides the benefits of Front Page 2000 that was mentioned in Chapter 3, Methodology (Software Requirement) it also has a great advantage over other similar software because changes and testing with

design and coding can be implement easily. The designing of pages are mostly done in design view provided by software and the necessary HTML codes are auto generated by the tool. In addition, it support other programming languages besides HTML and the codes can be attached directly to the HTML code without any special function to integrate the different programming languages.

Active Server Page (**ASP**), which enable Hypertext mark-up language (**HTML**) authors and web developers to mix HTML and inline scripting using almost any authoring tools. The script can reference component running on the local server, or any other server to access database, application or process information. When the browser requests an ASP file, it is processed by the server and the page is returned to the client as standard HTML.

Besides that, the pages involved in displaying data from database are created by using VB Script coding. JavaScripts coding are mainly used in implementing the interface design and to create the application's appearance through a attractive visual method with help features for the users.

Bugs and error in coding easily handled by Front Page 2000 by refusing to run certain program until they're fixed and debugging facilities are provided by Microsoft Development Environment, a debugging tool that enable one to find out what went wrong and work through the program slowly, possibly even statement.

5.6.1 Coding Approach and Specification

Based on the program design of Interactive Multimedia Learning Arithmetic and IQ Test, the bottom-up approach is chosen over the top-down approaches so that testing can be carried as soon as a module or sub-module has been completed. Furthermore, this approach enables critical functions to be coded and tested at the earlier stage.

5.6.2 Internal Documentation

Comment in creating a program provides a clear guide in understanding the program during the maintenance phase of the software development. Comments provide the developer with a means of communication with other readers of the source code. A statement of purpose indicating the function of the module and descriptive comments are embedded within the body of the source code is used to describe processing functions.

Chapter 6 : System Testing

6.0 System Testing

System testing is one of the main phases in the Water Fall Model. In the phase, the process of testing and debugging are done to detect defects and bugs of a system. These processes are usually done incrementally with system development. This phase is also often referred to as verification and validation. Verification refers to the set of activities that ensure that the system correctly implements a specific function. Validation refers to a different set of activities that ensure that has been built is traceable to user requirements.

The testing process involves in discovering the existence of program defects or errors. Most of the syntax errors can be found during compilation of codes and logical errors can only be found when a module is fully coded and compiled. In the process of detecting logical errors, dummy data are used as input and the output have to be checked for undesired results. The debugging process involves in location and repairing these defects and errors. Once these errors are found and repairs have been made, the module or codes have to be re-tested again until the errors are fully rectified.

6.1 Condition Testing

The system is thoroughly tested to ensure it functions correctly before the program processes actual data and produces information that people will rely on. The aim of is to identify caused by data entry mistakes and inconsistencies in the program. The program is tested using several steps which are data flow testing, unit testing, integration testing and system testing.

6.1.1 Data Flow Testing

Data flow testing method is used in determining the correct flow of data from user input interface to the database connected. The testing involves in confirming the display of the same data in both locations, the database (Microsoft Access) and the user interface (The ASP Page). Besides that, this method also ensure that the flow of one information to another related information is properly organized so that the user won't find it difficult and confused in retrieving the needed information.

6.1.2 Unit Testing

The program is tested separately in order to uncover errors in each module. The objective of unit testing is to identify and eliminate both execution errors which are errors

that cause the program to abnormally terminate and logic errors which are errors in the accuracy and completeness of the program's processing.

6.1.3 Integration Testing

Testing two or more modules together that depend on one another is called integration testing. Modules are typically integrated in a top down, incremental fashion. For Interactive Multimedia Learning Arithmetic and IQ Test, each modules of the top level of the system hierarchy are tested individually. After the first test, the next module is added. This procedure is doing repeatedly until all the modules are included in the testing.

6.1.4 System Testing

System testing is a similar process, but instead of integrating modules into programs for testing, it is integrate programs into systems. This is overall testing of the system to detect and error that may accur.

Chapter 7 : System Evaluation

7.0 System Evaluation

System evaluation is the process of identifying system strength and limitation by measuring the system being built against expectations. During the period of coding and implementation of this system, various problems were encountered. These problems will solved, through references on notes documentation, notes users discussion groups and discussion among friends. These step have helped me to identify the system's strength, limitation and enhancements.

7.1 System Strength

evaluation of the system strength is focused on the strength of Microsoft FrontPage 2000, ASP pages, Java Scripts, VB Scripts and the common language, the HTML. By developing the system with all these coding tools, this system has inherited the strength of being able to execute in multiplatform, reducing the burden of web server as well as being able to deliver a dynamic and interactive content on the Web.

7.1.1 Multiplatform

Interactive Multimedia Learning Arithmetic and IQ Test pages can be accessed through any operating system platform such as Windows NT, Windows 2000, and Windows 98. Besides that, the system can be executed in most of the current browser available such as Internet Explore 4 and above and Netscape Navigator. Hence, there are some limitations occur here as Netscape doesn't support few of the features that are available in Microsoft FrontPage 2000 meanwhile the system are fully feasible when browsed in Internet Explore 4 and above.

7.1.2 Reduce the burden of Web Server

Commonly used script in creating dynamic content of web pages is the Common Gateway Interface Script or better know as the CGI scripts. CGI, by their nature, place and extra burden on the web server. They are separate programs, which means the server process must spawn a new task for every CGI scripts that are execute. But, Interactive Multimedia Learning Arithmetic and IQ Test dynamic contents are created by Active Server Pages (ASP) coding, java scripts and VB Scripts. As mentioned earlier, the ease in embedding the scripts in HTML coding and the compatibility between these two scripts reduce the burden of web server in processing a task.

7.1.3 Dynamic and Interactive Contents

Web surfers nowadays are certainly not contented with only some static pictures and text. Interactive multimedia Learning Arithmetic and IQ Test web pages were designed in such a way that all the images, graphics and pictures involved in mostly animated and they rapidly change. The pages also allow users to interact with them and obtain the most up-to-date information as soon as data is updated in the database. Further more, audio and video also embedded in the web pages to increase the attractiveness.

7.1.4 Simple and User-friendly Interfaces

The web pages in Interactive Multimedia Learning Arithmetic and IQ Test system that were developed are simple and user-friendly. User who are familiar with Graphics User Interface (GUI) and World Wide Web should have no problem at all in browsing and using the system.

7.1.5 Online Help

On-line help provides user the necessary assistance where is seldom found in a web-based application. A simple to understand help developed in a proper format for easy references.

7.1.6 Speed Rapid Development

Interactive Multimedia Learning Arithmetic and IQ Test is developed in about three months. Speed rapid development is important because system that requires a gestation period to develop may be outdated even before it is ready to be used.

7.2 System Limitation

Due the time constraint and the constraints that occur while using Microsoft FrontPage 2000 with improper implementation environment, there are some limitations in Interactive Multimedia Learning Arithmetic and IQ Test.

7.2.1 Slow loading and processing speed of some JavaScripts, Flash movies and large Images.

Some JavaScripts take quite a while to be loaded, as they need to be interpreted before they are able to run. As they are coded with involvement of various of variables and procedures, this may take some time for the browser to go to the scripts before it able the scripts to be executed. The processing speed of some Flash Movies is also much slower if compared to other similar normal application. Large images take a long time to be fully viewable and depend of the speed of the Web Server.

7.2.2 Runs on ASP coding, JavaScripts and VB Scripts enabled browser only

To be able to browser Interactive Multimedia Learning Arithmetic and IQ Test, a user needs to have a ASP Coding, JavaScripts and VB scripts-enabled browser and can be best viewed only in Microsoft Internet Explorer, which is widely used. Some elements that are developed using Microsoft FrontPage 2000 can't run in browser other then Microsoft Internet Explorer.

7.2.3 Limited Access of Information

Although the major scope of this system are successfully developed, but certain information such as interactive between user and developer admin side are not available.

7.2.4 Lack of database stability using Microsoft Windows 98 or 2000

Interactive Multimedia Learning Arithmetic and IQ Test is currently running on Windows 98 platform. A web based application with database integration only runs well using Windows 98 or Windows 2000 as its platform. Besides that, as Interactive Multimedia Learning Arithmetic and IQ Test allows input from multi user from various places and at the same time, the stability of the database only can be assured if it runs under a Windows 98 or Windows 2000 platform.

7.3 Problems Encountered

7.3.1 ASP Coding Error

ASP coding is used in the check quiz and test page.

7.4 Future Enhancements

The development of any system is always a dynamic process. Further improvement and new ideas have come across while the system was being implemented. However, due to time and source constraints, not all of these ideas could be incorporated into the system.

Conclusion

Web applications has come a long way today and the technology has reached a level that allows one to focus on one's creativity instead of on the production aspect itself. So, development of Interactive Multimedia Learning Arithmetic and IQ Test system will not only consider the production and technical aspect of the system, instead will be "furnished" by graphically user interface with extraordinary graphics, images and buttons in the Interactive Multimedia Learning Arithmetic and IQ Test system will be a new approach compared to similar existing web sites.

Learning arithmetic is an interesting subject for web-based application because through this application medium, it can make students more enjoyable and learn arithmetic with more interesting and also very easy. Although by appearance, Interactive Multimedia Learning Arithmetic and IQ Test system is a normal user-friendly system, it has more powerful and specific purpose. It help user (the students) to gain knowledge on potential wide range of arithmetic and IQ knowledge. The user can learn four subjects of basic mathematic, that is addition, subtraction, multiplication and division. Other than that, the user also can test their IQ knowledge by this Interactive Multimedia Learning Arithmetic and IQ Test web-based system.

In the other view of Interactive Multimedia Learning Arithmetic and IQ Test, although this system meet its initial goals and specifications, there are still empty places

for further improvement, especially on the contents. Interactive Multimedia Learning Arithmetic and IQ Test was developed with multi usage of programming languages but still can be highly improved by using the latest web technology tools that available in the market. Web-based application is rapidly changing from time to time and the introduction of new application tools have made the web creation much more easier and enjoying. For example, using PHP coding as a programming language and Flash for the interactive test can be a highly improvement for the web-based application.

However, this Interactive Multimedia Learning Arithmetic and IQ Test focuses on developing the arithmetic skills and IQ knowledge for the children between age 8 to 10 years old by using web-based application. This web-based application considered valuable if one tends to serve the ever rapid growing Internet Industry.

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	June 2002	July 2002	Aug 2002	Sept 2002	Oct 2002	Nov 2002	Dec2002	Jan 2003	
Introduction									
Literature Review									
Methodology									
System Design									
System Implementation									
System Testing									
System Evaluation									

Project Shedule

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Questionnaire

INTERACTIVE MULTIMEDIA LEARNING
ARITHMETIC & IQ TEST

Name : .....

Age : .....

School Name : .....

Tick the appropriate answer

1. What is your opinion about this Learning System?

☐ Very Interesting ☐ Interesting ☐ Not Interesting

2. What is your opinion about the learning notes, quiz and test?

☐ Very Good ☐ Good ☐ Quite Good

3. Have you use Learning System like this before?

☐ Yes ☐ No

4. If compare with other system, which one is more interesting?
(Only answer this question if you choose YES in question3)

☐ This System ☐ Other System ☐ No Different

5. Which type of Learning System or Teaching System you like ?

☐ Conventional/ Traditional ☐ This new System

6. Should we keep on developing Learning System like this?

☐ Yes ☐ Wasting Time

Thanks for answering this questionnaire !!!